IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.: 10/821,371	§	Examiner:	Patel, K. M.
Filed: April 9, 2004	§	Group/Art Unit:	2188
Inventor(s):	§	Atty. Dkt. No:	5181-25901
Landin et al.	§	Confirm No.	1212
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Title: MULTI-NODE SYSTEM WITH GLOBAL ACCESS STATES	§		
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REQUEST FOR PRE-APPEAL BRIEF REVIEW

ATTN: BOX AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).

REMARKS

Claims 7-29 are pending in the application. Claims 7-15 and 18-30 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Rowlands et al. (U.S. Patent No. 6,948,035) (hereinafter "Rowlands1") in view of Rowlands et al. (U.S. Patent Publication No. 2004/0034747) (hereinafter "Rowlands2"), and Chen et al. (U.S. Patent No. 6,931,496). Applicant respectfully disagrees with the Examiner's final rejection and believes the rejection to be in error. Accordingly Applicant respectfully requests review of the final rejection in light of the following arguments.

Applicant's claim 7 as amended, recites a multi-node system comprising in pertinent part

> a node including a plurality of active devices and an interface coupled by an address network configured to convey address packets between the interface and the plurality of active devices, and a data network configured to convey data packets between the interface and the plurality of active devices, wherein the address network and the data network are separate networks;
>
> an inter-node network configured to convey coherency messages between the interface in the node and an additional interface in an additional node, wherein the additional interface is configured to send a coherency message requesting a read access right to a coherency unit on the inter-node network, wherein a given active device of the plurality of active devices has an ownership responsibility for the coherency unit;
>
> wherein the interface is configured to respond to the coherency message by sending a **proxy address packet** on the address network;
>
> wherein a different active device of the plurality of active devices is configured to request a read access right to another coherency unit by sending an address packet on the address network;
>
> wherein the given active device of the plurality of active devices has an ownership responsibility for the another coherency unit, wherein the given active device is configured to not transition the ownership responsibility for the another coherency unit in response to the address packet and to transition the ownership responsibility for the coherency unit in response to the proxy address packet. (Emphasis added)

The Examiner asserts Rowlands1 teaches the proxy packets recited in Applicant's claim 7 at col. 5, lines 53-62, and col. 6 lines 15-28. However, Rowlands1 discloses

> As used herein, coherency commands include any communications between nodes that are used to maintain coherency between nodes. The commands may include read or write requests initiated by a node to fetch or update a cache block belonging to another node, probes to invalidate cached copies of cache blocks in remote nodes (and possibly to return a modified copy of the cache block to the home node), responses to probe commands, fills which transfer data, etc. (See Col. 5, lines 5-12) (Emphasis added)
>
> For example, in one embodiment, if a transaction on the interconnect **22** (e.g. a transaction issued by the processors **12** A- **12** N) accesses a cache block that is remote to the node **10** (i.e. the cache block is part of the memory coupled to a different node) and

> the node **10** does not have sufficient ownership to perform the transaction, the memory bridge **32** may issue one or more coherency commands to the other nodes to obtain the ownership (and a copy of the cache block, in some cases). Similarly, if the transaction accesses a local cache block but one or more other nodes have a copy of the cache block, the memory bridge **32** may issue coherency commands to the other nodes. Still further, the memory bridge **32** may receive coherency commands from other nodes, and may perform transactions on the interconnect **22** to effect the coherency commands. (See Col. 5, lines 47-62) (Emphasis added)
>
> Generally, a remote node may begin the coherency process by requesting a copy of a cache block from the home node of that cache block using a coherency command. The memory bridge **32** in the remote node, for example, may detect a transaction on the interconnect **22** that accesses the cache block and may detect that the remote node does not have sufficient ownership of the cache block to complete the transaction (e.g. it may not have a copy of the cache block at all, or may have a shared copy and may require exclusive ownership to complete the transaction). The memory bridge **32** in the remote node may generate and transmit the coherency command to the home node to obtain the copy or to obtain sufficient ownership. The memory bridge **32** in the home node may determine if any state changes in other nodes are to be performed to grant the requested ownership to the remote node, and may transmit coherency commands (e.g. probe commands) to effect the state changes. The memory bridge **32 in each node** receiving the probe commands may effect the state changes and respond to the probe commands. Once the responses have been received, the memory bridge **32** in the home node may respond to the remote node (e.g. with a fill command including the cache block). (See Col. 6, lines 6-28) (Emphasis added)

From the foregoing, Applicant submits Rowlands1 is merely teaching that the memory bridge 32 can request, via coherency commands (probes), ownership from other nodes. In addition Rowlands1 also discloses performing transactions on the interconnect to effect the coherency commands from other nodes. However, Applicant submits the probes referred to by the Examiner are sent OUT of the node to other nodes and not within the node to the processors. In other words, the memory bridge 32 does not initiate a different kind of command such as a "proxy packet" internally on the interconnect 22 in response to receiving a coherency command from another node via the interfaces 30. Applicant contends (and argues further below) that the commands on the interconnect 22 are the same irrespective of whether they are remote or local commands.

In regard to the rejection of claim 14, and the Examiner's assertion that rdShs and cRdShd commands of Rowlands1 are analogous to Applicant's read to share and proxy read to share modified packets, respectively, Applicant respectfully disagrees. The "c" commands referred to in Rowlands1 are coherent commands issued to other nodes by the memory bridge 32, in response to commands received locally on the interconnect 22. Rowlands1 discloses

> The cRdShd or cRdExc commands may be issued by the memory bridge **32** in response to RdShd or RdExc transactions on the interconnect **22** , respectively, to read a remote cache block not stored in the node (or, in the case of RdExc, the block may be stored in the node but in the shared state). If the cache block is stored in the node (with exclusive ownership, in the case of the RdExc

> transaction), the read is completed on the interconnect **22** without any coherency command transmission by the memory bridge **32** . (See col. 19, ines 24-27) (Emphasis added)
>
> …a decision tree for a read transaction to a memory space address on the interconnect **22** of a node **10** is shown for one embodiment. The decision tree may illustrate operation of the node **10** for the read transaction for different conditions of the transaction, the state of the cache block accessed by the transaction, etc. The read transaction may, in one embodiment, include the RdShd, RdExc, RdKill, and RdInv transactions shown in the table **142** of FIG. **8** . (See col. 21, lines 11-19) (Emphasis added)

From the foregoing, it is clear to Applicant that the RdShd command is sent on the interconnect 22 regardless of whether the coherency command is a local request (i.e., from a processor within the node) or a remote request (i.e., from a processor in another node), and the cRdShd is sent by the memory bridge 32 to other nodes (not on interconnect 22) in response to a local RdShd command. Accordingly, this further illustrates that Rowlands1, does not disclose sending a proxy address packet on the address network if the coherency request comes from the interface in response to a remote coherency request, and a local active device sends an address packet on the address network within the node.

Applicant submits neither Rowlands2 nor Chen is relied upon, nor do they teach or suggest the above limitations. Thus Applicant submits none of the cited references teach or suggest "wherein the interface is configured to respond to the coherency message by sending a proxy address packet on the address network" or "wherein a different active device of the plurality of active devices is configured to request a read access right to another coherency unit by sending an address packet on the address network" or "wherein the given active device of the plurality of active devices has an ownership responsibility for the another coherency unit, wherein the given active device is configured to not transition the ownership responsibility for the another coherency unit in response to the address packet and to transition the ownership responsibility for the coherency unit in response to the proxy address packet," as recited in claim 7.

Accordingly, Applicant submits none of the references taken either singly or in combination, teaches or suggests the combination of features recited in Applicant's claim 7.

Claims 18, and 22 recite features that are similar to features recited in claim 7. Accordingly, Applicant submits claims 18 and 22, along with their respective dependent claims patentably distinguish over the cited references for at least the reasons given above.

CONCLUSION

If any fees are due, the Commissioner is authorized to charge said fees to Meyertons, Hood, Kivlin, Kowert, & Goetzel, P.C. Deposit Account No. 501505/5181-25901/SJC.

Respectfully submitted,

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